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User's Manual

Mini-ITX Motherboard 2807840

Version 5.0, August 2007

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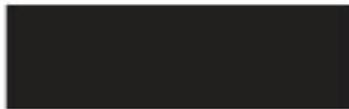Intel is a registered trademark of Intel Corporation.
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USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
5.0	Fifth Edition	Aug. 2007

Item Checklist

☑ Motherboard
☐ Cable for IDE(Option)
☑ CD for motherboard utilities
☐ Cable for USB Port 2/3 (Option)
☑ User's Manual
☐ Cable for COM2 Serial Port (Option)

Chapter 1

Introduction of VIA CN700 Chipset Motherboards

1-1   Feature of motherboard

The VIA CN700 Chipset motherboard series are designed for the new generation VIA C7™ processor family guaranteed both of the performance and stability of general purpose IPC and dedicated IPC platform solutions. The VIA CN700 north bridge chipset is fully optimized to provide the variety IPC platform solutions by featuring the high compatibilities and cost-effective support for HD digital media experience and the all new high bandwidth V4 bus as well as support for DDR2 memory modules which is expandable up to 1.0GB.

The VIA CN700 Chipset motherboard series utilize VIA CN700 north bridge chipset which supports 400 / 533MHz system bus of data transferring. With featuring a robust shared memory architecture and provides 133 / 166 / 200 MHz Memory clock frequency for DDR2 533 / 400 system memory modules. The motherboard series are embedded with VIA VT8237R Plus South Bridge that offers ULTRA **ATA 133** and **Serial ATA with RAID 0, 1, JBOD** functions to provide speedier HDD throughout that boosts overall system performance. The VIA CN700 north bridge chipset ITX motherboard series also implement the optional Realtek RTL8100C or Realtek RTL8110SC PCI LAN chip for the Fast Ethernet LAN function support of 10 / 100 Mb/s or 10 / 100 / 1000 Mb/s data transfer rate.

The motherboard series also have an integrated 6-channel AC'97 CODEC on board which is fully compatible with Sound Blaster Pro® that gives you the best sound quality and compatibility.

The VIA CN700 north bridge chipset ITX motherboard series are integrated with the VIA Graphics UniChrome™ Pro IGP graphics core, and it features the Chromotion CE Video Display engine with hardware MPEG-2 playback function and advanced 2D / 3D graphics core together to guarantee the exceptional playback and streaming of various digital video formats that keeps the benefits of ultra low power consumption and exerting minimal loading of embedded C7 processor.

Embedded USB controllers offer the capability of expanding to 8 of USB2.0 functional ports delivering 480Mb/s bandwidth of rich connectivity, these motherboards meet USB2.0 demands data transport demands which are also equipped with hardware monitor function on system to monitor and protect your system and maintain your non-stop business computing.

Targets at High Growth Markets: Digital Home / Digital Office / Digital World
-   Personal electronics such as personal video recorders (PVR), set top boxes, home theatres, digital audio centers, etc.
-   Mini PCs / Green clients / Quiet desktop PCs / High density servers
-   Home server appliances / Public information/entertainment kiosks / Point-of-Sales systems / Intelligent displays / Edge networking devices / Hospital monitoring systems / Municipal control & monitoring systems

1-2 Specification

Spec	Description
Design	∗ Mini ITX form factor 6 layers PCB size: 17.0x17.0cm
Chipset	∗ VIA CN700 Chipset ∗ VIA VT8237R Plus Chipset
CPU	∗ Embedded VIA CN700 NANO BGA processor
Memory Socket	∗ 240-pin DDR2 DIMM socket x1 ∗ Support DDR2 533/400 system RAM Modules DDR memory ∗ Expandable to 1GB
Expansion Slot	∗ 32-bit PCI slot x 1cs
Integrate VGA	∗ Integrate 2D/3D graphic Engines ∗ 8/16/32/64MB frame buffer using system memory ∗ Internal AGP 8x performance ∗ Support 24-bit 250MHz RAMDAC
Integrate IDE and Serial ATA RAID	∗ Two PCI IDE controllers support PCI Bus Mastering, ATA PIO/DMA and the ULTRA DMA 33/66/100/133 functions that deliver the data transfer rate up to 133 MB/s; Two Serial ATA ports provide 150 MB/sec data transfer rate for two Serial ATA Devices and offer RAID 0, 1, JBOD functions
Dual 10 / 100 LAN (For 7F4B Series)	∗ Integrated Dual Realtek RTL8100C LAN Chip supporting 10/100 BASE-T Transfer rate
Dual Gigabit LAN (For 7F4K Series)	∗ Integrated Dual Realtek RTL8110SC LAN Chip supporting 10/100/1000 BASE-T Transfer rate
Audio	∗ AC'97 Digital Audio controller integrated ∗ 6-channel AC'97 Audio CODEC onboard ∗ Audio driver and utility included
BIOS	∗ Award 4Mb Flash ROM
Multi I/O	∗ PS/2 keyboard and PS/2 mouse connectors ∗ Hard disk drive connector x1 ∗ VGA x1, Serial port x1 ∗ USB 2.0 connector x2 ∗ USB 2.0 Pin-header x2 (connecting cable is option) ∗ Parallel Port Pin-header x1(connecting cable is option) ∗ Serial COM Port COM2 Pin-header x1(connecting cable is option) ∗ Audio connector (Line-in, Line-out, MIC)

1-3   Layout Diagram & Jumper Setting

COM1   Optional LAN   LINE-OUT   MIC

PS/2 MOUSE

PS/2 Keyboard

VGA   USB   LINE-IN

Parallel Connector

USB/KB/MS Power ON Jumper**(JP1)**

ATX Power Connector

SFAN1

VIA C7 EBGA CPU

CPU FAN

DIMM Socket X1

PS2 KB/Mouse Port

VGA / COM1 Connector

Speaker/Power LED Conn.

F71805F LPC I/O Chip

4Mbit Flash ROM BIOS

USB Port**/LAN Connector**

Front Panel Connector

SFAN2

Dual   Optional RTL8110 SC

Gigabit LAN   PHY

VIA CN700 North Bridge

LINE OUT

VIA VT8237R Plus Chip

LINE IN

SATA Connector
(SATA1,SATA2)

MIC

COM2 Connector

ATA 133 IDE Connector
(IDE1)

CD Audio
Front Panel Audio

PCI Slot   USB Port (USB1/USB2)

USB Power
Clear CMOS (**JBAT**)   On Jumper (**JP3**)

3

Jumpers

Jumper	Name	Description	Page
JP1	Keyboard Power ON Function Setting	3-pin Block	p.5
JP3	USB Power On Function Setting	3-pin Block	p.5
JBAT	CMOS RAM Clear Function Setting	3-pin Block	p.6

Connectors

Connector	Name	Description	Page
ATXPWR	ATX Power Connector	20-pin Block	p.10
KB/MS1	PS/2 Mouse & PS/2 Keyboard Connector	6-pin Female	p.10
UL1 / UL2	RJ45 Over USB Connector	4-pin Connector	p.11
COM1	Serial Port Connector	25-pin Female	p.11
VGA	VGA Port Connector	15-pin Female	p.11
Line-In/Out, MIC	Line-Out/Line-In/MIC Audio Connector	Phone Jack	p.11
IDE1	Primary/Secondary Connector	40-pin Block	p.11
SATA1/2	Serial ATA IDE Connector	7-pin Connector	p.12

Headers

Header	Name	Description	Page
COM2	COM2 Serial Port Headers	10-pin Block	p.12
PARALLEL	Parallel Port Headers	25-pin Block	p.12
AUDIO	Line-Out/MIC output Header	4-pin Block	p.13
USB1/USB2	USB2.0 Port Headers	10-pin Block	p.13
HD_LED	Hard drive LED connector	3-pin Block	p.13
RESET	Reset switch lead	2-pin Block	p.13
SPEAK	Speaker connector	4-pin Block	p.13
PWR LED	Power LED Headers	2-pin Block	p.13
PWR BTN	Power Button Headers	2-pin Block	p.14
CPUFAN, SFAN1/2	FAN Speed Headers	3-pin Block	p.14
CDIN	CD Audio-In Headers	4-pin Block	p.14

Expansion Sockets

Socket/Slot	Name	Description	Page
DDR2	DDR2 SDRAM Module Socket	240-pin DDR2 SDRAM Module Expansion Socket	p.8
PCI1	PCI Slot	32-bit PCI Local Bus Expansion slots	p.9

Chapter 2

Hardware installation

### 2-1   Hardware installation Steps

Before using your computer, you had better complete the following steps:
1. Check motherboard jumper setting
2. Install CPU and Fan
3. Install System Memory (DIMM)
4. Install Expansion cards
5. Connect IDE and Front Panel /Back Panel cable
6. Connect ATX Power cable
7. Power-On and Load Standard Default
8. Reboot
9. Install Operating System
10. Install Driver and Utility

### 2-2   Checking Motherboard's Jumper Setting

(1)   Keyboard Power On function Enabled/Disabled (3-pin): JP1
   When setting Enabled you can using keyboard by key in password to power on system.

JP1

1-2 closed   K/B Power ON Disable (Default)

JP1

2-3 closed   K/B Power ON Enabled

Keyboard Power On Setting
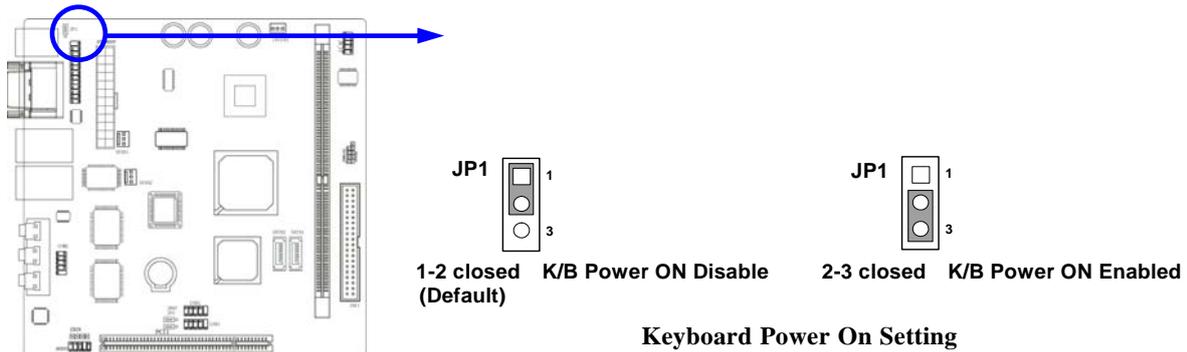
(2)   USB Power On function Enabled/Disabled (3-pin): JP3
   When setting Enabled you can using USB Device to power on system.

1   3

JP3

1-2 closed   USB Power On Disabled (Default)

1   3

JP3

2-3 closed   USB Power On Enabled
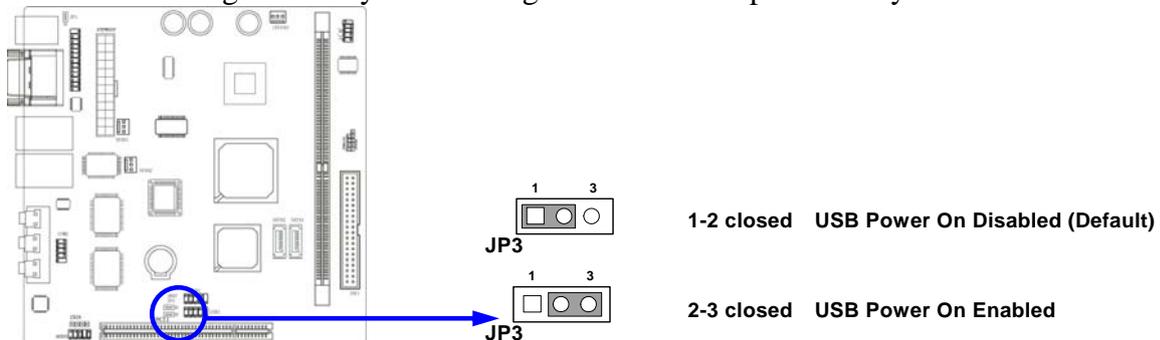
(3) CMOS RAM Clear (3-pin): JBAT

A battery must be used to retain the motherboard configuration in CMOS RAM short 1-2 pins of JPAT to store the CMOS data.

To clear the CMOS, follow the procedure below:
1. Turn off the system and unplug the AC power
2. Remove ATX power cable from ATX power connector
3. Locate JBAT and short pins 2-3 for a few seconds
4. Return JBAT to its normal setting by shorting pins 1-2
5. Connect ATX power cable back to ATX power connector

Note: When should clear CMOS
1. *Troubleshooting*
2. *Forget password*
3. *After over clocking system boot fail*

JBAT 1 3	JBAT 1 3
1-2 closed Normal (Default)	2-3 closed Clear CMOS

CMOS RAM Clear Setting
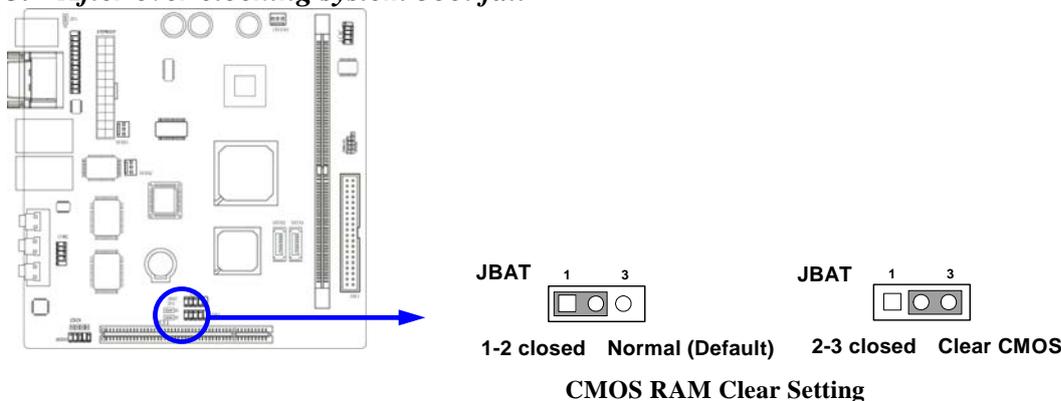
2-3   Glossary

Chipset (core logic) - two or more integrated circuits which control the interfaces between the system processor, RAM, I/O devises, and adapter cards.

Processor socket - the socket used to mount the system processor on the motherboard.

Slot (AGP, PCI, ISA, RAM) - the slots used to mount adapter cards and system RAM.

AGP - **A**ccelerated **G**raphics **P**ort - a high speed interface for video cards; runs at 1X (66MHz), 2X (133MHz), or 4X (266MHz).

PCI - **P**eripheral **C**omponent **I**nterconnect - a high speed interface for video cards, sound cards, network interface cards, and modems; runs at 33MHz.

Serial Port - a low speed interface typically used for mouse and external modems.

Parallel Port - a low speed interface typically used for printers.

PS/2 - a low speed interface used for mouse and keyboards.

USB - **U**niversal **S**erial **B**us - a medium speed interface typically used for mouse, keyboards, scanners, and some digital cameras.

Sound (interface) - the interface between the sound card or integrated sound connectors and speakers, MIC, game controllers, and MIDI sound devices.

BIOS (**B**asic **I**nput/**O**utput **S**ystem) - the program logic used to boot up a computer and establish the relationship between the various components.

Driver - software, which defines the characteristics of a device for use by another device or other software.

Processor - the "Central Processing Unit" (CPU); the principal integrated circuit used for doing the "computing" in "personal computer"

Front Side Bus Frequency - The working frequency of the motherboard, which is generated by the clock generator for CPU, DRAM and PCI BUS.

CPU L2 Cache - The flash memory inside the CPU, normally Pentium III CPU has 256K or above, while Celeron CPU will have 128K.

2-3-1 Setting CPU Bus Clock & Memory Clock Jumper

Setting the front side bus frequency and SDRAM frequency

The motherboard uses jumper less function for the front side bus frequency and SDRAM frequency users don't need setting any jumper when plug the CPU in motherboard

For experience user looking for over clocking possibility, please refer to sec 2-3-2.

2-3-2 Over clock Running

WARNING!	This section is for experienced motherboard installer only. Over clocking can result in system instability or even shortening life of the processor.

Users can choose over clock running by BIOS CMOS SETUP UTILITY.   When you entered CMOS SETUP UTILITY, choose "Miscellaneous Control" you will see the screen as below then.

```
                    Phoenix – AwardBIOS CMOS Setup Utility
                            Miscellaneous Control

    Auto Detect PCI Clock        Enabled
    Spread Spectrum              Disabled              Item Help
    ** Current Host Clock         100MHZ
    Host Clock at Next Boot       100MHZ
    ** Current DRAM CLOCK         266MHz **          Menu Level >
    DRAM Clock at Next Boot       266MHz(By SPD)
    VDIMM Select                 1.90V(Default)
     VAGP Select                 1.55V(Default)
     Flash Part Write Protect      Disabled


   ↑↓→← Move Enter:Select Item +/-/PU/PD:Value F10:Save ESC:Exit  F1:General Help
          F5:Previous Values  F6:Optimized Defaults F7:Standard Defaults
```

WARNING!	The Design of this motherboard follows chipset and CPU vender's design guideline. Any attempts to push beyond product specification are not recommended and you are taking your own risk to damage your system or important data. Before over clocking, you must make sure your components are able to tolerate such abnormal setting, especially CPU, memory, hard disks, and VGA cards.

2-4　Install Memory

The motherboards provide one 240-pin DUAL INLINE MEMORY MODULES (DIMM) sites for memory expansion available from minimum memory size of 64MB to maximum memory size of 1.0GB DDR2 SDRAM.

Valid Memory Configurations

Bank	240-Pin DIMM	PCS	Total Memory
Bank 0, 1　(DDR1)	DDR2 533/DDR2 400 DDR2 SDRAM Module	X1	64MB~1.0GB
Total	System Memory (Max. 1.0GB)	1	64MB~1.0GB

Generally, installing DDR SDRAM modules to your motherboard is very easy, you can refer to figure 2-4 to see what a 240-Pin DDR2 400/DDR2 533 DDR2 SDRAM module looks like.
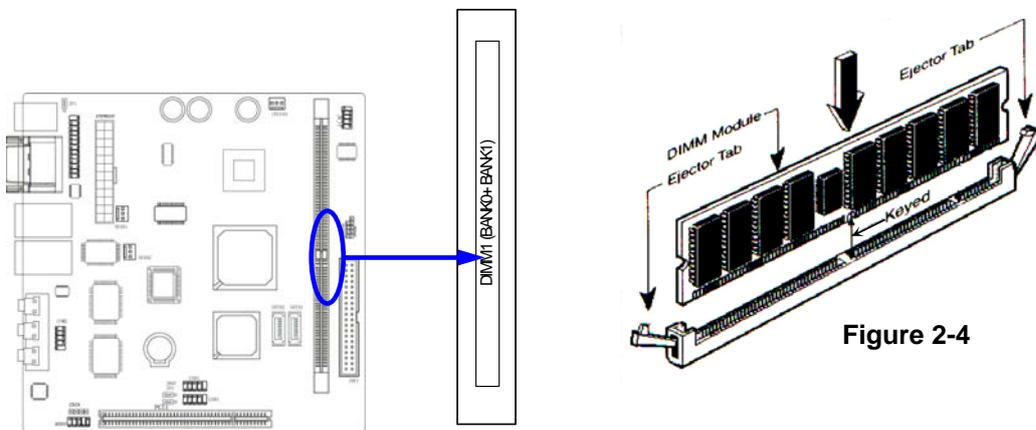

Figure 2-4

NOTE!	When you install DIMM module fully into the DIMM socket the eject tab should be locked into the DIMM module very firmly and fit into its indention on both sides.
WARNING!	For the DDR SDRAM CLOCK is set at 133MHz, use only DDR266-compliant DDR Modules.　When this motherboard operate at 133MHz, most system will not even boot if non-compliant modules are used because of the strict timing issues, if your SDR Modules are not DDR266-compliant, set the DDR SDRAM clock to 100MHz to ensure system stability.

2-5　Expansion Cards

WARNING!	Turn off your power when adding or removing expansion cards or other system components.　Failure to do so may cause severe damage to both your motherboard and expansion cards.

2-5-1 Procedure For Expansion Card Installation

1. Read the documentation for your expansion card and make any necessary hardware or software setting for your expansion card such as jumpers.
2. Remove your computer's cover and the bracket plate on the slot you intend to use.
3. Align the card's connectors and press firmly.
4. Secure the card on the slot with the screen you remove above.
5. Replace the computer system's cover.
6. Set up the BIOS if necessary.
7. Install the necessary software driver for your expansion card.

2-5-2 Assigning IRQs For Expansion Card

Some expansion cards need an IRQ to operate.　Generally, an IRQ must exclusively assign to one use.　In a standard design, there are 16 IRQs available but most of them are already in use.

Standard Interrupt Assignments

IRQ	Priority	Standard function
0	N/A	System Timer
1	N/A	Keyboard Controller
2	N/A	Programmable Interrupt
3 *	8	Communications Port (COM2)
4 *	9	Communications Port (COM1)
5 *	6	Sound Card (sometimes LPT2)
6 *	N/A	Floppy Disk Controller
7 *	7	Printer Port (LPT1)
8	N/A	System CMOS/Real Time Clock
9 *	10	ACPI Mode when enabled
10 *	3	IRQ Holder for PCI Steering
11 *	2	IRQ Holder for PCI Steering
12 *	4	PS/2 Compatible Mouse Port
13	N/A	Numeric Data Processor
14 *	5	Primary IDE Channel
15 *	N/A	Secondary IDE Channel

* These IRQs are usually available for ISA or PCI devices.

2-5-3　Interrupt Request Table For This Motherboard

Interrupt request are shared as shown the table below:

	INT A	INT B	INT C	INT D	INT E	INT F	INT G	INT H
Slot 1		√						
Onboard VGA	√							
Onboard USB 1	√							
Onboard USB 2		√						
LAN			√					
AC97/MC97			√					

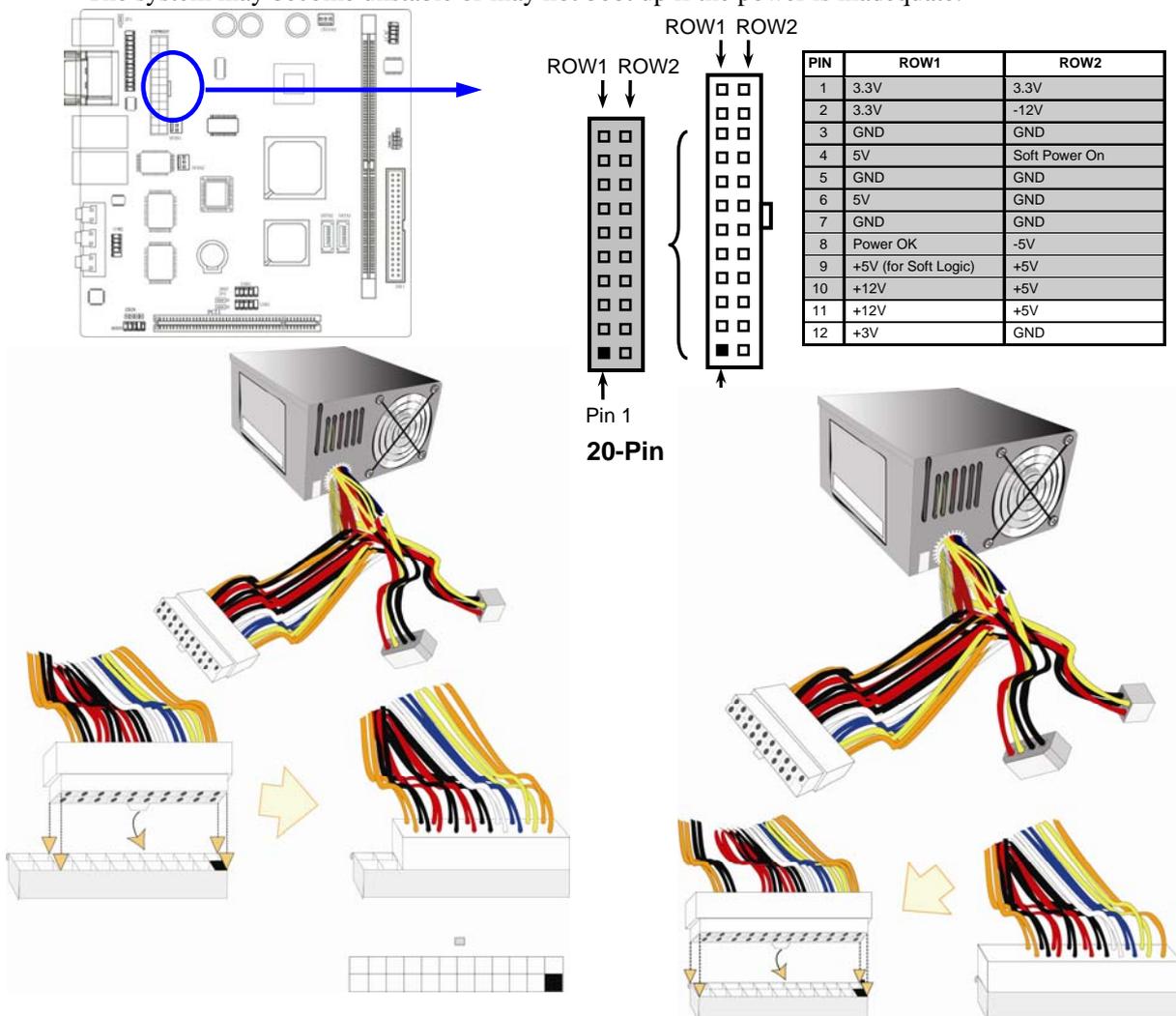| IMPORTANT!	If using PCI cards on shared slots, make sure that the drivers support "Shared IRQ" or that the cards don't need IRQ assignments. Conflicts will arise between the two PCI groups that will make the system unstable or cards inoperable.

2-6   Connectors, Headers
2-6-1   Connectors
(1)   Power Connector (24-pin block) : ATXPWR

ATX Power Supply connector.   This is a new defined 24-pins connector that usually comes with ATX case. The ATX Power Supply allows to use soft power on momentary switch that connect from the front panel switch to 2-pins Power On jumper pole on the motherboard.   When the power switch on the back of the ATX power supply turned on, the full power will not come into the system board until the front panel switch is momentarily pressed.   Press this switch again will turn off the power to the system board.

**   We recommend that you use an ATX 12V Specification 2.0-compliant power supply unit (PSU) with a minimum of 80W power rating. This type has 24-pin and 4-pin power plugs.

**   If you intend to use a PSU with 20-pin and 4-pin power plugs, make sure that the 20-pin power plug can provide at least 6.6A on +12V and the power supply unit has a minimum power rating of 80W. The system may become unstable or may not boot up if the power is inadequate.

PIN	ROW1	ROW2
1	3.3V	3.3V
2	3.3V	-12V
3	GND	GND
4	5V	Soft Power On
5	GND	GND
6	5V	GND
7	GND	GND
8	Power OK	-5V
9	+5V (for Soft Logic)	+5V
10	+12V	+5V
11	+12V	+5V
12	+3V	GND

ROW1 ROW2

ROW1 ROW2

Pin 1

20-Pin

(2) PS/2 Mouse & PS/2 Keyboard Connector: KB/MS1

If you are using a PS/2 mouse, you must purchase an optional PS/2 mouse set which connects to the 5-pins block and mounts to an open slot on your computer's case.

(3) USB Port connector: UL1 / UL2

The connectors are 4-pins connector that connect USB devices to the system board, and standard RJ45 connector for Gigabit or 10/100 BASE-T LAN function.

(4) Serial Port Connector (9-pin female): COM1

Serial Port connector is a 9-pin D-Subminiature connector.   The On-board Serial Port can be disabled through the BIOS SETUP.   Please refer to Chapter 3 "INTEGRATED PERIPHERALS SETUP" section for more detail information.

(5) VGA Connector (15-pin female): VGA

VGA Connector is a 15-pin D-Subminiature Receptacle connector. This connector is for connection Monitor and System to display.
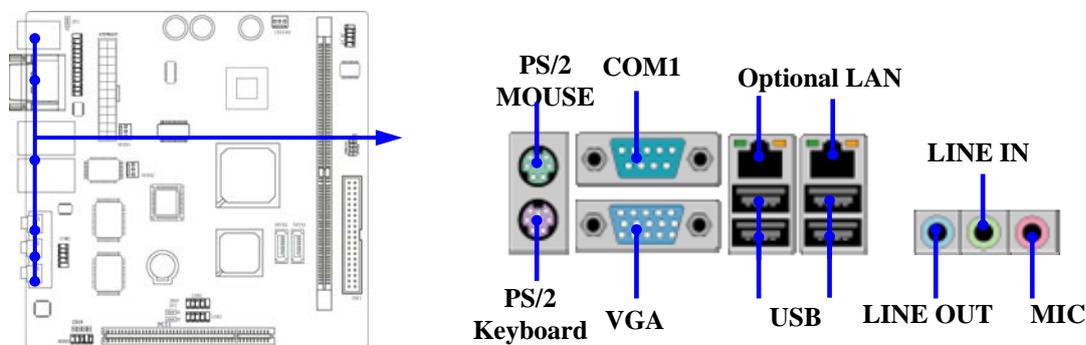
(6) Audio Connector: (Line-Out/ Line-IN/ MIC)

This Connector are 3 phone Jack for LINE-OUT/ LINE-IN/ MIC.

**Line-out :**   Audio output to speaker
Line-In :   Audio input to Audio controller
MIC :   Microphone Connector

(7) Primary IDE Connector (40-pin block): IDE1

This connector supports the provided IDE hard disk ribbon cable. After connecting the single plug end to motherboard, connect the two plugs at other end to your hard disk(s). If you install two hard disks, you must configure the second drive to Slave mode by setting its jumpers accordingly. Please refer to the documentation of your hard disk for the jumper settings.
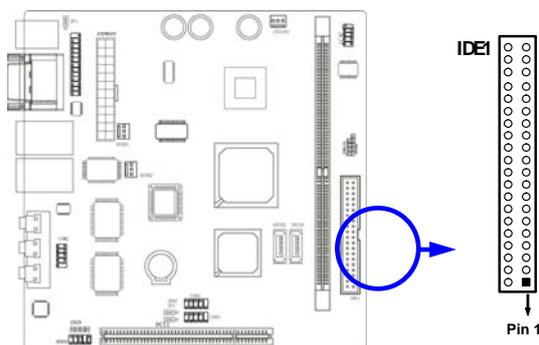

● Two hard disks can be connected to each connector.   The first HDD is referred to as the "Master" and the second HDD is referred to as the "Slave".

● For performance issues, we strongly suggest you don't install a CD-ROM or DVD-ROM drive on the same IDE channel as a hard disk.   Otherwise, the system performance on this channel may drop.

(8) Serial-ATA Port connector: SATA1 / SATA2

This connector supports the provided Serial ATA IDE hard disk cable to connecting the motherboard and serial ATA hard disk.


Serial-ATA Compatible Connectors
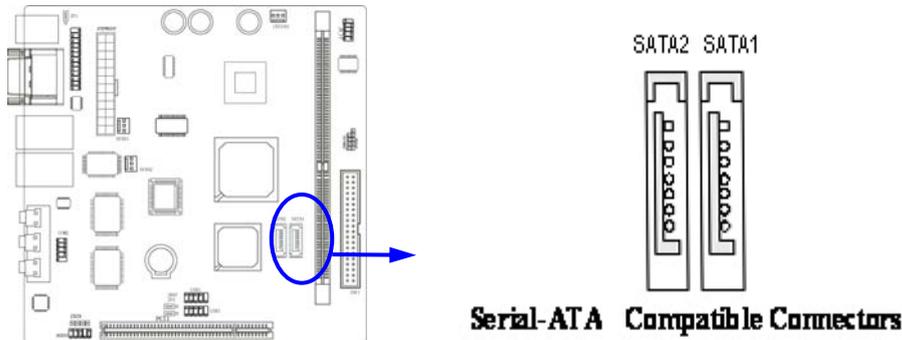
2-6-2 Headers

(1) COM2 Serial Port Headers (9-pin) : COM2

This board has two serial port COM1 (Connector)/COM2(Headers), it come with cable providing serial port COM1/COM2. The On-board serial port can be disabled through BIOS SETUP. Please refer to Chapter 3 "INTEGRATED PERIPHERALS SETUP" section for more detail information.

Pin 1

COM2

*Note: Orient the read marking on the COM1/2 ribbon cable to pin 1*
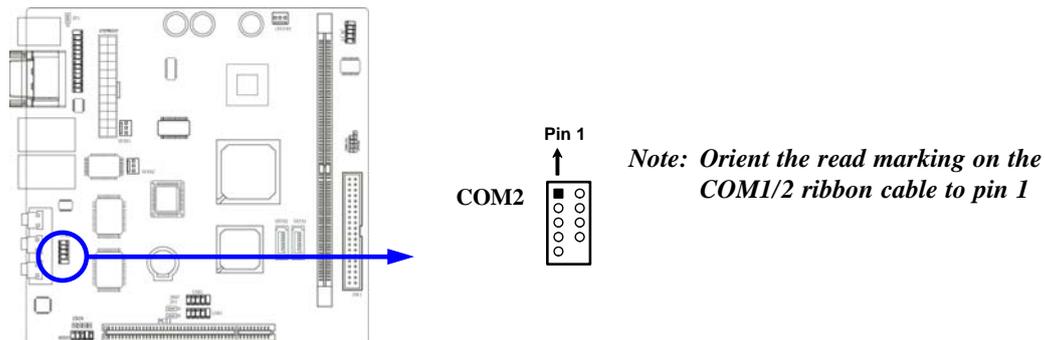
(2) Parallel Port Headers (25-pin Block): Parallel

The On-board Parallel Port can be disabled through the BIOS SETUP. Please refer to Chapter 3 "INTEGRATED PERIPHERALS SETUP" section for more detail information.


Pin 1

PARALLEL Connector
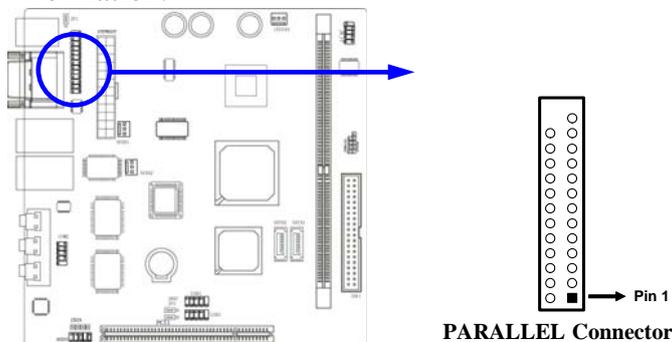
(3) Line-Out, MIC Header (9-pin): AUDIO

This header connects to Front Panel Line-out, MIC connector with cable.

Line-Out, MIC Headers
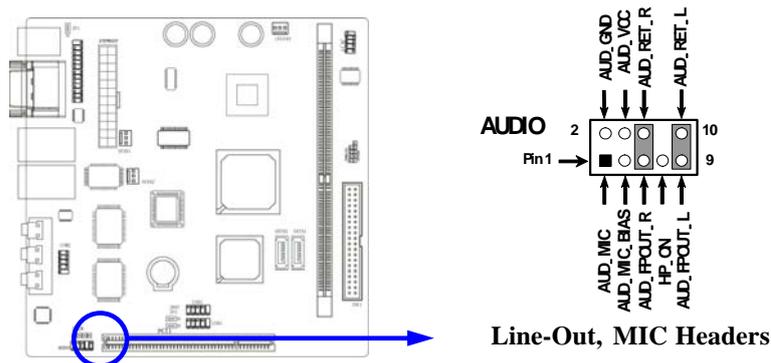
(4) USB Port Headers (9-pin) : USB1/USB2

These headers are used for connecting the additional USB port plug.   By attaching an option USB cable, your can be provided with two additional USB plugs affixed to the back panel.

USB Port Headers
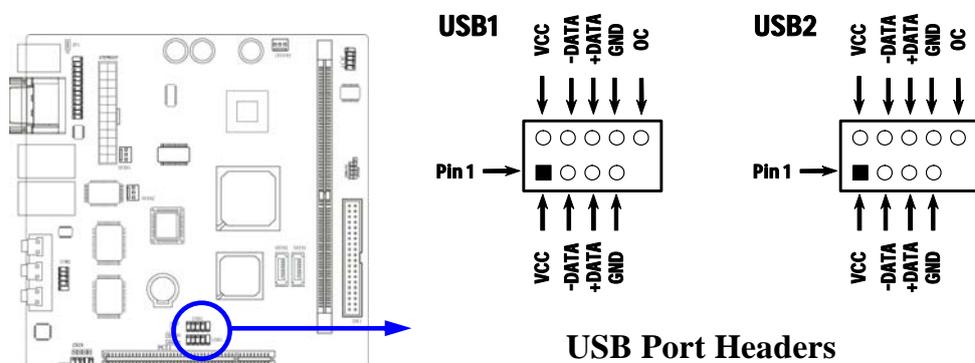
(5) IDE Activity LED: HD_LED

This connector connects to the hard disk activity indicator light on the case.

(6) Reset switch lead: RESET

This 2-pin connector connects to the case-mounted reset switch for rebooting your computer without having to turn off your power switch.   This is a preferred method of rebooting in order to prolong the lift of the power supply unit.   See the figure below.

(7) Speaker connector: SPEAK

This 4-pin connector connects to the case-mounted speaker. See the figure below.

(8) Power LED: PWR LED

The Power LED is light on while the system power is on.   Connect the Power LED from the system case to this pin.

(9) Power switch: PWR BTN

This 2-pin connector connects to the case-mounted power switch to power ON/OFF the system.

System Case Connections
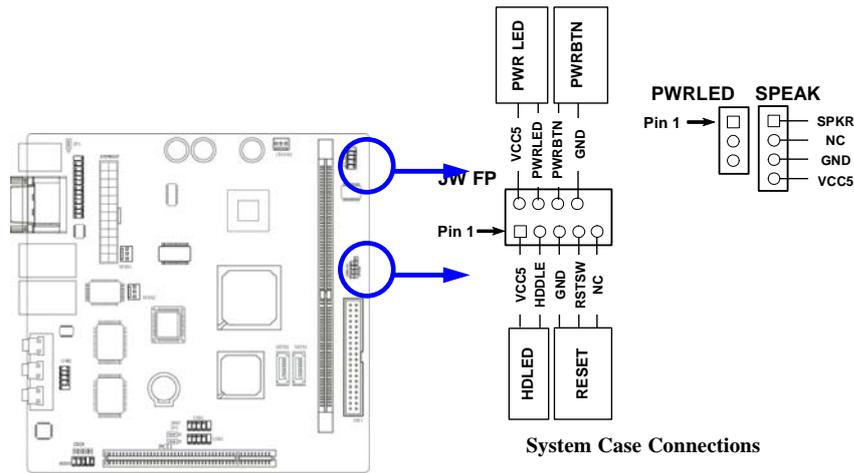
(10) FAN Speed Headers (3-pin) : CPUFAN, SFAN1/SFAN2

These connectors support cooling fans of 350mA (4.2 Watts) or less, depending on the fan manufacturer, the wire and plug may be different. The red wire should be positive, while the black should be ground. Connect the fan's plug to the board taking into consideration the polarity of connector.
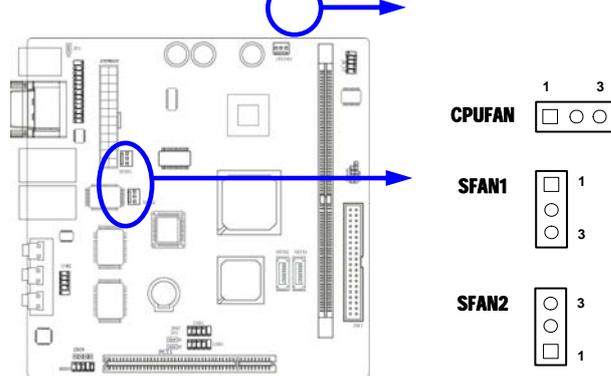
(11) CD Audio-In Headers (4-pin) : CDIN

CDIN is the connectors for CD-Audio Input signal. Please connect it to CD-ROM CD-Audio output connector.

CD Audio-In Headers
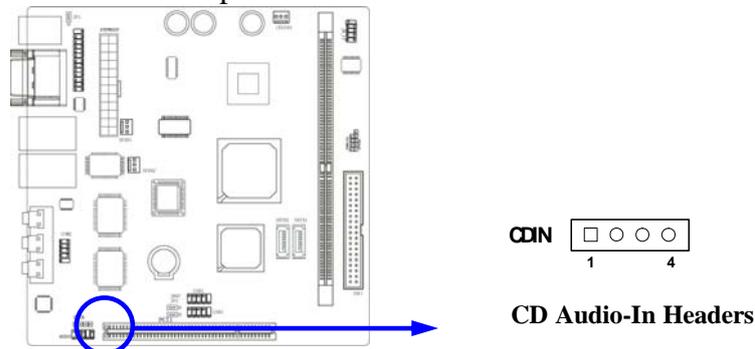
2-7　　Starting Up Your Computer

1. After all connections are made, close your computer case cover.
2. Be sure all the switch are off, and check that the power supply input voltage is set to proper position, usually in-put voltage is 220V~240V or 110V~120V depending on your country's voltage used.
3. Connect the power supply cord into the power supply located on the back of your system case according to your system user's manual.
4. Turn on your peripheral as following order:
   a. Your monitor.
   b. Other external peripheral (Printer, Scanner, External Modem etc…)
   c. Your system power.　For ATX power supplies, you need to turn on the power supply and press the ATX power switch on the front side of the case.
5. The power LED on the front panel of the system case will light.　The LED on the monitor may light up or switch between orange and green after the system is on.　If it complies with green standards or if it is has a power standby feature.　The system will then run power-on test.　While the test are running, the BIOS will alarm beeps or additional message will appear on the screen.

   If you do not see any thing within 30 seconds from the time you turn on the power.　The system may have failed on power-on test. Recheck your jumper settings and connections or call your retailer for assistance.

Beep	Meaning
One short beep when displaying logo	No error during POST
Long beeps in an endless loop	No DRAM install or detected
One long beep followed by three short beeps	Video card not found or video card memory bad
High frequency beeps when system is working	CPU overheated System running at a lower frequency

6. During power-on, press <Delete> key to enter BIOS setup.　Follow the instructions in BIOS SETUP.
7. **Power off your computer:** You must first exit or shut down your operating system before switch off the power switch.　For ATX power supply, you can press ATX power switching after exiting or shutting down your operating system.　If you use Windows 9X, click **"Start"** button, click **"Shut down"** and then click **"Shut down the computer?"** The power supply should turn off after windows shut down.

Any advice or comments about our products and service, or anything we can help you with please don't hesitate to contact with us. We will do our best to support your products, projects and business.

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